

# PATENT COÖPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
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**PCT**

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## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year)

**20 MAY 2005**

Applicant's or agent's file reference

DRE-0175

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

PCT/US05/03236

International filing date (day/month/year)

28 January 2005 (28.01.2005)

Priority date (day/month/year)

28 January 2004 (28.01.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): B01F 13/08 and US Cl.: 366/273

Applicant

DREXEL UNIVERSITY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US05/03236

**Box No. I Basis of this opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US05/03236

**Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)

Claims 4-5, 10-12, 15-17 YES

Claims 1-3, 6-9, 13, 14 NO

Inventive step (IS)

Claims 10-12, 15-17 YES

Claims 1-9, 13, 14 NO

Industrial applicability (IA)

Claims 1-17 YES

Claims NONE NO

**2. Citations and explanations:**

Claims 1-3, 6-9, 13 and 14 lack novelty under PCT Article 33(2) as being anticipated by US 6,231,760 B1 (SIDDIQI). Regarding claim 1, SIDDIQI discloses a device comprising a fluid holding chamber (84) comprising an inner and outer surface; a fluid in contact with the inner surface of the fluid holding chamber, said fluid containing a dispersion of magnetic particles (col. 10 line 64 to col. 11 line 12) and a dispersion of non-magnetic particles (see col. 10, lines 42-63); and at least two sources (82A-82F) of magnetic fields positioned in close proximity to the chamber which produce a changeable pattern of magnetic field minima and maxima regions (see col. 7 line 61 to col. 8 line 14 and col. 18 lines 46-61). Regarding claim 2, the chamber being plastic is disclosed in col. 6, lines 54-56. The inner surface of the chamber would therefore intrinsically comprise an array of different molecules. Regarding claim 3, an array of different nanoparticles or microparticles is attached to the inner surface of the chamber (see col. 9 lines 34-37 and col. 11, lines 7-9). Regarding claim 6, the magnetic particles comprising magnetic nanoparticles, paramagnetic ions, or molecular magnets (see col. 10 line 64 to col. 11 line 14). Regarding claim 7, the particles may be iron-oxide or rare earth metals (see col. 11, lines 1-2). Regarding claim 8, the magnetic nanoparticles have a surface covered by molecules which provide steric hinderance (see col. 11, lines 15-22). Regarding claim 9, the magnetic sources comprise an array of magnetizable features. Claim 13 fails to further limit the claimed structure. Regarding claim 14, the sources of magnetic fields comprise an array of conductors and a means for switching or varying electrical current in said conductors (see col. 11, lines 27-32).

Claims 4 and 5 lack an inventive step under PCT Article 33(3) as being obvious over US 6,231,760 B1 (SIDDIQI), discussed above. The reference does not disclose a sensor in the chamber. However, it would have been obvious to one of ordinary skill in the art to have selected appropriate sensors.

Claims 10-12 and 15-17 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the further limitations of these dependent claims.

Claims 1-17 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.